Baseline Environmental Investigation

Final
Site-Specific Field Sampling Plan and
Site-Specific Safety and Health Plan Attachments
for the Chemical Defense Training Facility, Parcel 126Q-CWM

Fort McClellan
Calhoun County, Alabama

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Delivery Order CK07
Contract No. DACA21-96-D-0018
IT Project No. 780567

May 1999

Revision 1

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List of Acronyms

ADEM	Alabama Department of Environmental Management
AST	aboveground storage tank
BDO	battle dress over-garments
bgs	below ground surface
CAM	chemical agent monitor
CDTF	Chemical Defense Training Facility
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CLP	Contract Laboratory Program
COC	chain of custody
CWA	chemical warfare agent
°F	degrees Fahrenheit
DOD	U.S. Department of Defense
DOJ	Department of Justice
DOT	U.S. Department of Transportation
DS2	Decontamination Solution No. 2
DQO	data quality objective
EBS	environmental baseline survey
EG&G	EG&G, Inc.
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FTMC	Fort McClellan
GB	sarin
GPS	global positioning system
HTH	calcium hypochlorite
HTRW	hazardous, toxic, or radioactive waste
ID	induced-draft
IDW	investigation-derived waste
IT	IT Corporation
O&M	operation and maintenance
PID	photoionization detector
PVC	polyvinyl chloride

List of Acronyms *(Continued)*

QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SSHP	site-specific safety and health plan
USACE	U.S. Army Corps of Engineers
UST	underground storage tank
VX	nerve agent (O-ethyl-S- [diisoproplaminoethyl]-methylphosphonothiolate)
Weston	Roy F. Weston, Inc.
WP	installation-wide work plan

Executive Summary

In accordance with Contract No. DACA21-96-D-0018, Delivery Order CK07, IT Corporation (IT) will conduct investigation activities at the Chemical Defense Training Facility (CDTF), Parcel 126Q-CWM, Fort McClellan (FTMC), Calhoun County, Alabama, to determine the baseline environmental condition at this site. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for hazardous, toxic, or radioactive waste (HTRW) sampling activities at the CDTF site.

There are six primary buildings located at the CDTF site. These buildings include the following:

- Guardhouse Building (4480)
- Administrative Building (4481)
- Training Building and Filter Pad Building (4482)
- Incinerator Building (4483)
- Waste Treatment and Operation and Maintenance (O&M) Building (4484)
- Facility Storage Building.

Roy F. Weston, Inc. (1990) identified the following areas as having the potential to be contaminated at the CDTF site (Environmental Science and Engineering, Inc., 1998):

- Air filtration system: spent carbon from the filters for the Training Building is treated in the on-site Incinerator.

- Decontamination operations wastewater collection sump: 800-gallon sump receives rinse water from the decontamination operations. The sump is epoxy-coated and enclosed within the Training Building on the north side of the building. This sump water is piped to the holding tank. Water in the holding tank is incinerated.

- Laboratory wastewater collection sump: receives rinse water from the laboratory during daily operations. The sump is epoxy-coated and enclosed within the Training Building. This sump is piped to the decontamination operation sump previously described and subsequently to the holding tank and is then incinerated.

- Wastewater holding tank: stainless-steel aboveground 20,000-gallon holding tank.

- Used equipment storage bay: this storage bay is used to store protective garments (including undergarments) that have been worn in training exercises. Garments are decontaminated and stored at this location prior to disposal in the Incinerator.

- CDTF Incinerator: used for disposal of wastewater, protective garments, and activated carbon filters.

Operating procedures at the CDTF are as follows:

- Small amounts of sarin (GB) and nerve agent (VX) (O-ethyl-S[diisoproplamino-ethyl]-methylphosphonothiolate) (VX) are manufactured on site from the binary components. The resulting chemical warfare agents (CWA) are stored within this complex in locked vaults.

- Students are issued their clothing (including undergarments) to wear into the "Hot Area" of the CDTF Training Building during CWA training. Clothing is monitored after use in specially designed holding bins using real-time low level monitors after personnel exit the "Hot Area" to ensure decontamination.

- Training aids (various materials and equipment) are contaminated with a small amount of CWA.

- Trainees move from one bay to another in the Training Building performing detection, identification, and decontamination exercises using standard Army equipment.

- The decontaminating agent of choice for the Army is Decontamination Solution No. 2 (DS2).

- Personnel decontamination procedures include:

  - A specific undressing procedure is used, followed by a hot rinse shower, then a regular shower.

  - Equipment and rubber items are placed in monitoring bins and then undergo a wash with soap and hot water (180 degrees Fahrenheit).

  - Battle dress over-garments (BDO) (carbon impregnated) are autoclaved after each use. BDOs are used four times, and then incinerated.

- All waste generated within the "Hot Area" is incinerated at the CDTF Incinerator.

- Each of the seven training bays has a drainage trench that flows into a common trench and then into a sump in Training Bay No. 7. Liquids from the sump are pumped to a 20,000-gallon tank via overhead pipes. The pH adjustment, originally employed, generated large volumes of salts that required disposal (waste salts were disposed of in the Industrial Landfill) Therefore, the CDTF no longer employs this chemical neutralization process. Wastewater is sent to the Incinerator, and wastewater analysis is performed to confirm compliance with Alabama Department of Environmental Management criteria for incineration.

- Water in the 20,000-gallon tank is analyzed for CWA. The water is then incinerated. The Incinerator can easily burn 200 gallons per hour. It is now fired with natural gas; previously, fuel oil was used.

- Approximately 3,600 pounds of ash from the CDTF Incinerator is disposed of in an FTMC Industrial Landfill annually.

- A small amount of caustic is stored on site to prepare a dilute mixture (55 gallons in 4,000 gallons of water) for scrubbers and soft water treatment.

The objective of this work is to determine the baseline environmental condition of the CDTF, and to determine if the facility operations have impacted the soil and groundwater. The CDTF is scheduled to be transferred to the Department of Justice (DOJ), Center for Domestic Preparedness. This SFSP will not address the investigation of the interior of the Training Building or other buildings within the CDTF. The current CDTF operating contractor, EG&G, Inc. (EG&G), will conduct CWA sampling within the CDTF buildings. The results of the EG&G CWA sampling program within the buildings will be combined with the HTRW characterization information collected by IT to establish the baseline environmental condition of the CDTF site.

IT will collect 17 surface soil samples, 13 subsurface soil samples, 5 groundwater samples, 2 depositional soil samples, 1 surface water, and 1 sediment sample at this site. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, metals, and organophosphorus pesticides. The environmental condition of the CDTF will be presented in a summary report that combines results from these analyses conducted during the IT HTRW sampling program with results from the EG&G CWA sampling program .

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) for the CDTF site will be used in conjunction with the site-specific safety and health plan (SSHP), and the installation-wide work plan and SAP. The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

1.0 Project Description

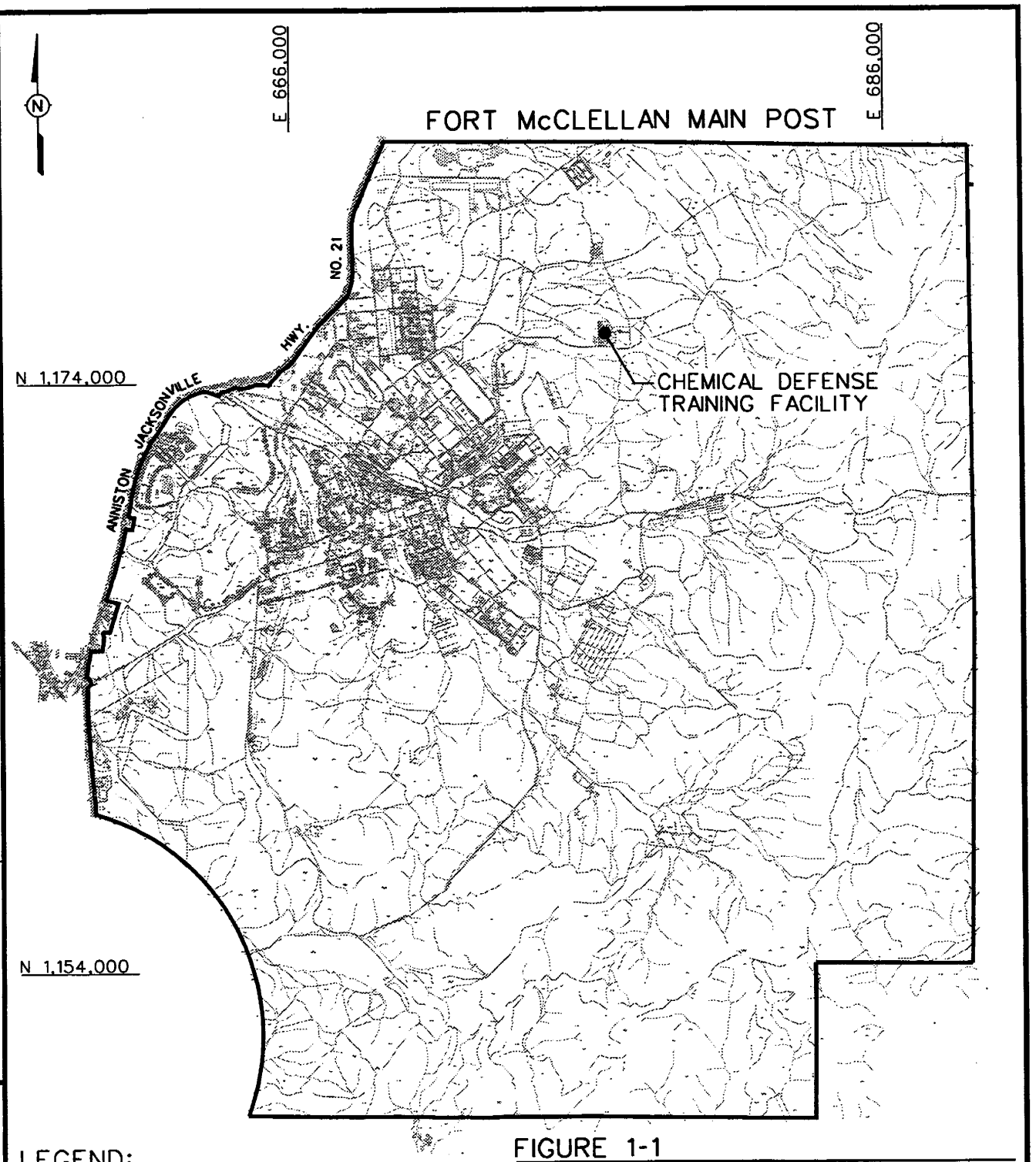
1.1 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the baseline environmental investigation of the Chemical Defense Training Facility (CDTF), Parcel 126Q-CWM, under Delivery Order CK07, Contract No. DACA21-96-D-0018. The objective of this investigation is to determine the baseline environmental condition of the CDTF, and to determine if the facility operations have impacted the soil and groundwater. The CDTF is scheduled to be transferred to the Department of Justice (DOJ), Center for Domestic Preparedness.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at the CDTF, Parcel 126Q-CWM. This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the CDTF, and the installation-wide work plan (WP) (IT, 1998b) and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and quality assurance plan (QAP).

1.2 Site Description

The CDTF is located on the north-central portion of the Main Post (Figure 1-1). The CDTF is currently an active, high-security facility. The facility has been used from 1987 to the present. The site covers approximately 8 acres (Figure 1-2). Trainees move from one bay to another in the Training Building (4482) performing detection, identification, and decontamination exercises using standard Army equipment. The chemicals used at this site include sarin (GB), nerve agent (VX) (O-ethyl-S-[diisoproplaminoethyl]-methylphosphonothiolate), sodium hydroxide, bleach, Decontamination Solution No. 2 (DS2), calcium hypochlorite (HTH), silver fluoride, silver nitrate, and buffer solutions. Radioactive sources, americium-241, and nickel-63 are used in Army CWA detection equipment and stored at the CDTF. GB and VX are the only CWAs used at this facility, and their use is only within the CDTF Training Building 4482, "Hot Area" (Environmental Science and Engineering [ESE], 1998). All of the training using CWM and hazardous materials were conducted within the CDTF Training Building.



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FORT McCLELLAN BOUNDARY

SCALE

0 5000 10000 FEET

FIGURE 1-1
SITE LOCATION MAP
CHEMICAL DEFENSE TRAINING FACILITY
PARCEL 126Q-CWM

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

E 676,100
E 676,700
E 677,300
N 1,175,900
N 1,175,500
N 1,175,100
EMPTY 40,000 GAL FUEL OIL AST PARCEL 62(7)
FLOW DIRECTION
WASTE TREATMENT AND O&M BUILDING 4484
INCINERATOR STACK
4000 GAL AST PARCEL 62(7)
20,000 GAL WASTE WATER AST PARCEL 62(7)
INCINERATOR BUILDING 4483
PARCEL 104(7)
FLOW DIRECTION
DRIVES/PARKING
EXCAVATION FOR 5000 GAL DIESEL UST REMOVAL, PARCEL 59(7)
EXISTING 4000 GAL DIESEL AST (OLD SULFURIC ACID AST) PARCEL 62(7)
SUMP
FILTER STACK
CDTF WATER TANK
4485
FILTER PAD BUILDING
4489
TRAINING BUILDING 4482
DRIVES/PARKING
STORAGE BUILDING
MOCKUP TRAINING STATIONS
GUARD HOUSE
PARKING
4480
ADMINSTRATIVE BUILDING 4481
FLOW DIRECTION
975
950
925
900
SD
M
SCALE
0 120 240 FEET

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- UTILITY POLE
- SANITARY SEWER LINE
- STORM DRAINAGE LINE

FIGURE 1-2
SITE MAP
CHEMICAL DEFENSE TRAINING FACILITY
PARCEL 126Q-CWM

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

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PROJ. MGR.: J. YACOUB
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There are six primary buildings located at the CDTF site (Figure 1-2). These buildings include the following:

- Guardhouse Building (4480)
- Administrative Building (4481)
- Training Building and Filter Pad Building (4482)
- Incinerator Building (4483)
- Waste Treatment and Operation and Maintenance (O&M) Building (4484)
- Facility Storage Building.

These six buildings were all built during the initial construction of the CDTF, and their uses have not changed from their original intended purpose. However, the Administrative Building (4481) has been modified and upgraded to better accommodate the work staff.

The Guardhouse Building (4480) is manned solely for security purposes at the CDTF site and is staffed 24 hours-a-day, 7 days-a-week, by either civilian guards or Military Police. Items stored at the Guardhouse Building include:

- Guard's personal items
- Security supplies
- One M43A1 Chemical Agent Alarm with an americium-241 source.

The Administrative Building (4481) is used not only for administration, but also for instructional lectures and mask fitting of soldiers. Items stored at the Administrative Building include the following:

- Administrative supplies
- Janitorial supplies
- Military personnel personal items
- Accumulated mercuric cyanides
- M43A1 Chemical Agent Alarms with americium-241 sources
- Training supplies
- Stannic chloride
- Amyl acetate (banana oil)
- Silver nitrate
- Sulfur
- Sulfuric acid
- Isopropylamine.

The Training Building and Filter Pad Building (4482) is the heart of the CDTF, where student training is accomplished, using nerve agent in life-like, practical scenarios. This building was designed to train 3,500 to 5,000 military personnel per year in toxic chemical agent decon-

tamination procedures. Binary chemical agents are currently used and DS2 is employed in the decontamination procedures. The building contains seven chemical agent training bays and is operated under a negative pressure basis (Roy F. Weston, Inc. [Weston], 1990). The contaminated air from the training bays is released through the charcoal filters, prior to going out the stack. Items stored in the Training Building and at the Filter Pad Building include the following:

- Training supplies
- Medical supplies
- Janitorial supplies
- Administrative supplies for Safety Control
- Laboratory supplies
- M43A1 Chemical Agent Alarms with americium-241 sources
- Liquid bleach (decontaminating agent)
- HTH (calcium hypochlorite - dry or granular bleach - a decontaminating agent)
- DS2 (decontaminating agent)
- Mask filters (no whetlerite)
- Nerve agents GB and VX (not to exceed 1 liter total GB and VX)
- Binary precursors QL and OF
- Stannic chloride
- Amyl acetate (banana oil)
- Charcoal filters
- Cooling Tower treatment
- Lithium bromide (chiller cooling medium)
- Chemical agent monitors (CAM) with nickel-63 sources
- Acetone
- Hydrogen
- Carbon disulfide
- Hydrogen sulfide.

Air handling filters (intake filters) clean air before the air enters the CDTF Training Building, and there is little possibility of these filters being exposed to CWA. Spent air handling filters are disposed of in the on-site Incinerator. Induced-draft (ID) filters treat air before it is released from the CDTF Training Building. The treated air is released up the Filter Stack. The ID filters contain activated carbon generated from coconut-based charcoal (no chromium used in the manufacture). Spent ID filters are documented free of CWA and then pyrolized for 15 minutes at 1000 degrees Fahrenheit (°F) prior to disposal.

There are five mockup training stations (similar to the training bays in the Training Building) east of the Training Building (4482) where personnel demonstrate decontamination procedures without using CWA. CWA is only used in the chemical agent training bays inside of the Training Building.

The Incinerator Building (4483), Parcel 104(7) contains the Incinerator, Pyrolyzer, and Autoclave. The Incinerator is used to destroy liquid waste, solid wastes, and gases at a temperature of greater than 1700°F. The heat from the Incinerator goes through the boiler that generates steam for use within the CDTF.

Operation of the Incinerator, Parcel 104(7) began in 1987 and continues to date. The Incinerator treats nonhazardous wastewater, personnel protective clothing, and other solid waste (e.g., plastic, paper, rubber, glass, and metal) that are generated during decontamination training exercises (ESE, 1998). The Incinerator is currently fueled by natural gas (fuel oil previously) and operates under a state air permit. The solid residue is drummed and sent to the FTMC Industrial Landfill for disposal. Approximately 3,600 pounds of ash are disposed of in the Industrial Landfill annually (ESE, 1998). The ash generated from the Incinerator is tested semiannually for toxicity characteristic leaching procedure metals.

Canister carbon filters containing chromium VI are the only hazardous waste that goes through the CDTF Incinerator for decontamination only. The waste is decontaminated at 1000°F for 15 minutes and then drummed and shipped to an off-site hazardous waste landfill. The carbon filters are characteristically hazardous for chromium and are properly handled and managed as hazardous waste.

The Pyrolyzer, located in Building 4483, is used to destroy all solid nonhazardous waste and bring the previously agent contaminated materials (3X Level) to a temperature of 1000°F for 15 minutes (5X level), which is necessary to release from Government control. The Autoclave, also located in Building 4483, is used to steam-clean the 3X battle dress over-garments (BDO) at 250°F and 15 pounds per square inch. This enables the Government to reuse the BDOs up to four times.

The term 3X indicates a level of decontamination for materials, equipment, and facilities by approved procedures. Also, there cannot be any contamination detected. An agent symbol with 3X indicates that the item has been surface decontaminated by locally approved procedures, bagged or contained in an agent-tight barrier (plastic bags may be used if they have been tested and found to be effective for the purpose), of sufficient volume to permit sample air to be withdrawn while minimizing dilution with incoming air, and/or appropriate tests/ monitoring have verified that concentrations above 0.0001 mg/m3 for agents GA/GB (tabun/sarin), 0.00001 mg/m3 for agent VX (organophosphorus nerve agent), 0.003 mg/m3 for H (Levinstein mustard) or L (lewisite), or 0.00003 mg/m3 for agent GD (soman) (Army, 1997).

"Items decontaminated to 3X can not be furnished to qualified DOD or Industry users or subjected directly to open flame (cutting, welding, high temperature heating devices), or operations which generate extreme heat, such as drilling and machining unless the following two conditions are met (Army, 1978):

(a) It is determined that decontamination to 5X level will destroy the usefulness of the item: and,

(b) Decontamination to a degree lessor than 5X in combination with administrative and technical safeguards will eliminate risk of injury. As a minimum, an approved SOP (setting forth the specific operational limitations, precautions to be observed, and monitoring necessary to assure safety) will be available and decontamination will be performed under the direction of the Certifying Officer."

The term 5X indicates the equipment or facilities have been completely decontaminated, are free of hazards, and may be released for general use or to the general public (Army, 1978). An agent symbol with 5X indicates an item has been decontaminated completely of the indicated agent and may be released for general use or sold to the general public in accordance with all applicable federal, state, and local regulations. An item is decontaminated completely when the item has been subjected to procedures that are known to completely degrade the agent molecule, or when analyses, submitted through Major Army Command (MACOM) and Department of Army (DA) channels for approval by the Department of Defense Explosive Safety Board (DDESB), have shown that the total quantity of agent is less than the minimal health effects dosage as determined by The Surgeon General. 5X condition must be certified by the commander or designated representative. One approved method is heating the item to 538 degrees C (1000 degrees F) for 15 minutes. This is considered sufficient to destroy chemical agent molecules (Army, 1997).

Items stored at the Incinerator Building include:

- Lawn and grounds equipment
- 20 gallons of gasoline for equipment
- Oil for equipment
- 5X ash.

The Waste Treatment and O&M Building (4484) is the section of the CDTF where all operation and maintenance functions are performed and boiler treatment and water treatment are accomplished. Items stored at the Waste Treatment and O&M building include:

- Janitorial supplies
- Administrative supplies for O&M
- O&M tools, equipment, and supplies
- 3X material
- Bleach, DS2, and laundry supplies
- Boiler and water treatment supplies
- Salt
- Caustic (two 55-gallon drums for the scrubber)
- 3X ash
- 20,000-gallon wastewater storage tank
- 40,000-gallon soft water storage tank to which one 55-gallon drum of caustic is added for scrubber liquid.

The Facility Storage Building is used to store training aids. The Facility Storage Building was constructed on site in 1998. There are not any hazardous materials reportedly stored in the Facility Storage Building. Items stored in the Facility Storage Building include:

- Training aids
- Training supplies
- Laundry supplies.

The total number of americium 241 sources used in the M43A1 Chemical Agent Alarms is 45 at 250 microCuries. The total number of nickel 63 sources used in the CAMs is 29 at 10 micro-Curies.

Operating procedures at the CDTF are as follows:

- Small amounts of GB and VX are manufactured on site from the binary components. The resulting agents are stored within this complex in locked vaults.
- Students are issued their clothing (including undergarments) to wear into the "Hot Area" of the CDTF Training Building during CWA training. Clothing is monitored after use in specially designed holding bins using real-time low level monitors after personnel exit the "Hot Area" to ensure decontamination.

- Training aids (various materials and equipment) are contaminated with a small amount of CWA.

- Trainees move from one bay to another in the Training Building performing detection, identification, and decontamination exercises using standard Army equipment.

- The decontaminating agent of choice for the Army is DS2; U.S. Marines use bleach, and the U.S. Navy uses HTH.

- Personnel decontamination procedures include:

  - A specific undressing procedure is used, followed by a hot rinse shower, then a regular shower.

  - Equipment and rubber items are placed in monitoring bins and then undergo a wash with soap and hot water (180°F).

  - BDOs (carbon impregnated) are autoclaved after each use. BDOs are used four times, and then incinerated.

- All waste generated within the "Hot Area" is incinerated at the CDTF Incinerator.

- Each of the seven training bays has a drainage trench that flows into a common trench and then into a sump in Training Bay No. 7. Liquids from the sump are pumped to a 20,000-gallon tank via overhead pipes. The pH adjustment, originally employed, generated large volumes of salts that required disposal (waste salts were disposed of in the Industrial Landfill). Therefore, the CDTF no longer employs this chemical neutralization process. Wastewater is sent to the Incinerator, and wastewater analysis is performed to confirm compliance with Alabama Department of Environmental Management (ADEM) criteria for incineration.

- Water in the 20,000-gallon tank is analyzed for CWA. The water is then incinerated. The Incinerator can easily burn 200 gallon per hour. It is now fired with natural gas; previously, fuel oil was used.
- Approximately 3,600 pounds of ash from the CDTF Incinerator is disposed of in an FTMC Industrial Landfill annually.

- A small amount of caustic is stored on site to prepare a dilute mixture (55 gallons in 4,000 gallons of water) for scrubbers and soft water treatment.

Four aboveground storage tanks (AST) are located at the CDTF site (Figure 1-2). The environmental baseline survey (EBS) lists Parcel 62(2) for all four of these ASTs. Three of the ASTs were located within a concrete berm southwest of the Waste Treatment and O&M Building (4484). However, one of the ASTs is a 4,000-gallon tank that previously held sulfuric acid, but

had been empty for several years and was moved to store diesel fuel on the east side of the Training Building (4482). Sulfuric acid is no longer used at the CDTF. The second AST is a 4,000-gallon tank that currently holds a caustic soda solution. Both of these tanks had lines that fed into a third AST, a 20,000-gallon wastewater tank. The wastewater contains liquid decontamination wastes generated in the CDTF Training Building. The fourth AST, located northwest of Building 4484, is a 40,000-gallon fuel oil tank that is empty. This AST was used to supply fuel to the Incinerator prior to the CDTF switching to natural gas. There are no immediate plans to remove or replace the remaining three ASTs (ESE, 1998).

One underground storage tank (UST), Parcel 59(7), was located at Building 4482 at the CDTF. This UST was a 5000-gallon heating oil tank. This UST was removed September 17, 1998. The UST was found not leaking and in good condition. All removed soil was returned to the excavation (Reisz, 1998). This UST was closed in accordance with ADEM guidelines; Chapter 2.0 further discusses the UST removal activities at Building 4482.

Only one leak has occurred at the CDTF. The sulfuric acid and caustic tanks were originally manifolded to the same 2-inch pipe for transfer of chemicals to the 20,000-gallon wastewater tank. This transfer line began leaking at a point within the containment area during transfer of sulfuric acid. A small volume of acid (approximately 1 quart) leaked and was subsequently neutralized and cleaned up. The CDTF no longer uses sulfuric acid, and the AST has been moved near the east side of the Training Building and now contains diesel fuel.

The average elevation at the CDTF site is approximately 915 feet (National Geodetic Vertical Datum of 1929). Local shallow groundwater direction is probably controlled by topography and is likely to the north or northwest at the site (Figure 1-2). The soils found at this site are composed of the Anniston and Allen Series soils. The depth to bedrock typically ranges from 2 feet to greater than 10 feet. The depth to the water table for this series is usually greater than 20 feet. An intermittent stream flows northwest past the north side of the CDTF site. This intermittent stream eventually flows northwest into Cave Creek near Cemetery Hill.

The Anniston and Allen Series of soils consists of strongly acid, deep, well-drained soils that have developed in old local alluvium. The parent material washed from the adjacent higher-lying Linker, Muskingum, Enders, and Montevallo soils, which developed from weathered sandstone, shale, and quartzite. These sites contain sandstone and quartzite gravel and cobbles, which measure as much as 8 inches in diameter on the surface and throughout the soil.

Soils at this site fall into the Anniston and Allen stony loams, 0 to 10 percent slopes (AdC). This mapping unit has a surface layer that is a very dark brown to dark grayish-brown stony loam, 6 to 10 inches thick. Below this is a dark-red or dark reddish-brown upper subsoil of stony fine sandy clay loam. These soils are permeable, have medium infiltration, and have a high capacity for moisture (U.S. Department of Agriculture, 1961).

1.3 Scope of Work

The scope of work for activities associated with the baseline environmental investigation at the CDTF, specified by the statement of work (USACE, 1999), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Collect 15 surface soil samples, 11 subsurface soil samples, 5 groundwater samples, 2 depositional soil samples, 1 surface water sample, and 1 sediment sample to determine whether contaminants are present at the CDTF site and to determine the environmental condition of the CDTF.

This SFSP will not address the investigation of the interior of the Training Building. The current CDTF operating contractor, EG&G, Inc. (EG&G), will conduct CWA sampling within the CDTF buildings. The results of the EG&G CWA sampling program within the buildings will be combined with the hazardous, toxic, or radioactive waste (HTRW) characterization information collected by IT to establish the baseline environmental condition of the CDTF.

2.0 Summary of Existing Environmental Studies

ESE conducted an EBS to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance on fast track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release, or disposal (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

One underground storage tank (UST), Parcel 59(7), was located at Building 4482 at the CDTF. This UST was a 5000-gallon heating oil tank. This UST was removed September 17, 1998. The UST was found not leaking and in good condition. All removed soil was returned to the excavation (Reisz, 1998). The sample results data from samples collected in the UST excavation during removal are presented in Table 2-1. The sample results indicated that the soil concentrations in

Table 2-1

Sample Data from the Removal of the 5,000-Gallon UST at Building 4482, Parcel 59(7)
Chemical Defense Training Facility, Parcel 126Q-CWM
Fort McClellan, Calhoun County, Alabama

Bldg No.	Sample ID No.	Sample Location	Sample Date	TPH-418.1 mg/kg	Benzene µg/kg	Ethyl Benzene µg/kg	Toluene µg/kg	Xylenes µg/kg
4482	UST-1	Excavation Floor	9/17/98	12	<5	<5	<5	<5
4482	UST-2	Excavation Floor	9/17/98	18	<5	<5	<5	<5
4482	UST-3	Excavation Floor	9/17/98	89	<5	<5	<5	<5
4482	UST-4	Excavation Floor	9/17/98	65	<5	<5	<5	<5
4482	UST-5	Stockpile	9/17/98	<10	<5	<5	<5	<5

µg/kg - Micrograms per kilogram.
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.

the excavations were below ADEM guidelines; therefore, the UST removal and the excavation were approved by ADEM for closure. Also, an exploratory direct-push soil boring was installed next to the excavation. Refusal was encountered at approximately 25 feet below ground surface (bgs) and groundwater was not encountered before reaching refusal. There were not any samples collected from the direct-push boring for chemical analysis (Reisz, 1998). A copy of the closure report is included as Attachment A.

Based on the available history of the site, this is the only investigation that has been performed at the CDTF site.

Weston (1990) identified the following areas as having the potential to be contaminated at the CDTF site (ESE, 1998):

- Air filtration system: spent carbon from the filters for the Training Building is treated in the on-site Incinerator.
- Decontamination operations wastewater collection sump: 800-gallon sump receives rinse water from the decontamination operations. The sump is epoxy-coated and enclosed within the Training Building on the north side of the building. This sump water is piped to the holding tank.
- Laboratory wastewater collection sump: receives rinse water from the laboratory during daily operations. The sump is epoxy-coated and enclosed within the Training Building. This sump is piped to the decontamination operation sump previously described and subsequently to the holding tank.
- Wastewater holding tank: stainless-steel aboveground 20,000-gallon holding tank.
- Used equipment storage bay: this storage bay is used to store protective garments (including undergarments) that have been worn in training exercises. Garments are decontaminated and stored at this location prior to disposal in the Incinerator.
- CDTF Incinerator: used for disposal of wastewater, protective garments, and activated carbon filters.

During the EBS site visit, CDTF personnel indicated that the entire interior of the Training Building where CWA is manufactured (from binary components), stored, or used should be considered contaminated (ESE, 1998). However, this SFSP will not address the investigation of the interior of the Training Building. The current CDTF operating contractor, EG&G, will conduct CWA sampling within the CDTF. The results of the EG&G CWA sampling program will be combined with the HTRW information collected by IT to establish a baseline of the environmental condition at the CDTF site.

This site is a parcel where various types of materials, equipment, vehicles, hazardous materials, and hazardous wastes have been treated. Some of these materials may possibly have been released onto the site or to the environment. The CDTF site lacks adequate documentation and, therefore, requires additional evaluation to determine the baseline environmental condition of the parcel.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objectives (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the investigation of the CDTF site. This section incorporates the components of the DQO process described in the EPA publication EPA 540-R-93-071, *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to the CDTF site is described in more detail in Section 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and the procedures necessary to meet the objectives of the baseline environmental investigation.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP (IT, 1998a). Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The intended data users and available data related to the baseline environmental investigation at the CDTF are presented in Table 3-1. The data users for the data and information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to determine the baseline environmental condition of the site.

3.3 Data Types and Quality

Surface and subsurface soil, groundwater, depositional soil, surface water, and sediment will be sampled and analyzed to meet the objectives of the baseline environmental investigation at the CDTF site. Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported

Table 3-1

Summary of Data Quality Objectives
Chemical Defense Training Facility, Parcel 126Q-CWM
Fort McClellan, Calhoun County, Alabama

Potential Data Users	Available Data	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD, FTMC, IT Corporation, Department of Justice, Other contractors, and possible future land users	Limited closure data for UST removal at Building 4482	Surface Soil Subsurface Soil Groundwater Depositional Soil Surface Water Sediment	Investigation to determine the baseline environmental condition of the CDTF site Definitive quality data for future decision-making	Surface soil TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	17 surface soil samples + QC
				Subsurface Soil TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	13 subsurface soil samples + QC
				Groundwater TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	5 groundwater samples + QC
				Depositional Soil TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	2 depositional soil samples + QC
				Surface Water TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	1 surface water sample + QC
				Sediment TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	1 sediment sample + QC

ADEM - Alabama Department of Environmental Management.
CESAS - Corps of Engineers South Atlantic Savannah.
DOD - U.S. Department of Defense.
EPA - U.S. Environmental Protection Agency.
FTMC - Fort McClellan.
QC - Quality control.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
USACE - U.S. Army Corps of Engineers.

using hard copy data packages. In meeting the quality needs of this baseline environmental investigation, the data analyzed at this level of quality are appropriate for site characterization.

3.4. Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this baseline environmental investigation are provided in Chapter 9.0 of the QAP (IT, 1998a).

4.0 Field Activities

4.1 Utility Clearances

Prior to performing any intrusive sampling, a utility clearance will be performed at all locations where surface soil, subsurface soil, groundwater, and depositional soil samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP (IT, 1998a). The site manager will mark the proposed locations with stakes, coordinate with the installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are cleared, the stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling program during the baseline environmental investigation at the CDTF includes the collection of 15 surface soil samples, 11 subsurface soil samples, 5 groundwater samples, 2 depositional soil samples, 1 surface water sample, and 1 sediment sample for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition of the site.

4.2.1 Surface Soil Sampling

Surface soil samples will be collected from 15 soil locations at the CDTF site.

4.2.1.1 Sample Locations and Rationale

The surface soil sampling rationale is provided in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2.

4.2.1.2 Sample Collection

Surface soil samples will be collected from the upper 1 foot of soil by hand-auger or direct-push technology in accordance with the procedures specified in Section 4.7.1.1 of the SAP (IT, 1998a). The collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. Sample documentation and chain of custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

Table 4-1

Sample Locations And Rationale
Chemical Defense Training Facility, Parcel 126Q-CWM
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
CDTF-126Q-GP01	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the east side of the Incinerator Building 4483. Sample data will indicate if contaminant releases (spills, stack emissions, routine maintenance, etc.) into the environment have occurred from use of the Incinerator and if contaminated soil exists at this site.
CDTF-126Q-GP02	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the north side of the Incinerator Building 4483. Sample data will indicate if contaminant releases (spills, stack emissions, routine maintenance, etc.) into the environment have occurred from use of the Incinerator and if contaminated soil exists at this site.
CDTF-126Q-GP03	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the west side of the Incinerator Building 4483. Sample data will indicate if contaminant releases (spills, stack emissions, routine maintenance, etc.) into the environment have occurred from use of the Incinerator and if contaminated soil exists at this site.
CDTF-126Q-GP04	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the east side of the Waste Treatment and O&M Building 4484. Sample data will indicate if contaminant releases (spills, routine maintenance, etc.) into the environment have occurred and if contaminated soil exists at this site.
CDTF-126Q-GP05	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the north side of the Waste Treatment and O&M Building 4484. Sample data will indicate if contaminant releases (spills, routine maintenance, etc.) into the environment have occurred and if contaminated soil exists at this site.
CDTF-126Q-GP06	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the north side of the former 40,000-gallon fuel oil AST. Sample data will indicate if contaminant releases (spills, routine maintenance, etc.) into the environment have occurred and if contaminated soil exists at this site.
CDTF-126Q-GP07	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the south side of the Waste Treatment and O&M Building 4484. Sample data will indicate if contaminant releases (spills, routine maintenance, etc.) into the environment have occurred and if contaminated soil exists at this site.
CDTF-126Q-GP08	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the east side of the AST concrete berm southeast of the Waste Treatment and O&M Building 4484. Sample data will indicate if contaminant releases have occurred from the AST concrete berm area and if contaminated soil exists at this site.
CDTF-126Q-GP09	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the north side of the AST concrete berm southeast of the Waste Treatment and O&M Building 4484. Sample data will indicate if contaminant releases have occurred from the AST concrete berm area on the west side of Building 4484 and if contaminated soil exists at this site.
CDTF-126Q-GP10	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the west side of the AST concrete berm southeast of the Waste Treatment and O&M Building 4484. Sample data will indicate if contaminant releases have occurred from the AST concrete berm area and if contaminated soil exists at this site.
CDTF-126Q-GP11	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the south side of the AST concrete berm southeast of the Waste Treatment and O&M Building 4484. Sample data will indicate if contaminant releases have occurred from the AST concrete berm area and if contaminated soil exists at this site.
CDTF-126Q-GP12	Surface soil	Surface soil sample location placed on the east side of the CDTF in the Buffer Zone. Sample data will indicate if contaminant releases have occurred from stack emissions to soils in the surrounding area of the CDTF.
CDTF-126Q-GP13	Surface soil	Surface soil sample location placed on the north side of the CDTF in the Buffer Zone. Sample data will indicate if contaminant releases have occurred from stack emissions to soils in the surrounding area of the CDTF.
CDTF-126Q-GP14	Surface soil	Surface soil sample location placed on the west side of the CDTF in the Buffer Zone. Sample data will indicate if contaminant releases have occurred from stack emissions to soils in the surrounding area of the CDTF.

Table 4-1

Sample Locations And Rationale
Chemical Defense Training Facility, Parcel 126Q-CWM
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
CDTF-126Q-GP15	Surface soil	Surface soil sample location placed on the south side of the CDTF in the Buffer Zone. Sample data will indicate if contaminant releases have occurred from stack emissions to soils in the surrounding area of the CDTF.
CDTF-126Q-GP16	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the north side of the 4000 gallon diesel AST and the excavation for the 5000 gallon diesel UST. Sample data will indicate if contaminant releases have occurred from the UST and AST area and if contaminated soil exists in this area.
CDTF-126Q-GP17	Surface soil and subsurface soil	Soil boring for surface and subsurface soil samples to be placed on the east side of the 4000 gallon diesel AST near the Facility Storage Building . Sample data will indicate if contaminant releases have occurred from the AST and the area near the Facility Storage Building and if contaminated soil exists in this area.
CDTF-126Q-DEP01	Depositional Soil	Sample location is the drainage area on the west side of the CDTF near the northeast corner of the fence. Sample data will indicate if contaminant releases have occurred from runoff from the facility to the surrounding area of the CDTF..
CDTF-126Q-DEP02	Depositional Soil	Sample location is the drainage area on the west side of the CDTF near the center of the west fence. Sample data will indicate if contaminant releases have occurred from runoff from the facility to the surrounding area of the CDTF.
CDTF-126Q-SW/SD01	Surface Water and Sediment	Sample location is the intermittent stream on the northeast side of the CDTF. Sample data will indicate if contaminant releases have occurred from runoff from the facility to the intermittent stream that flows northwest past the CDTF.
CDTF-126Q-MW01	Groundwater	This permanent monitoring well will be installed downgradient of the Training Building 4482. Sample data will indicate if underground piping or the sump has leaked to surrounding soils. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
CDTF-126Q-MW02	Groundwater	This permanent monitoring well will be installed downgradient of the Filter Stack and Filter Pad at the Training Building 4482. Sample data will indicate if contaminant releases have occurred to surrounding soils from the Filter Bank Stack or the stack blowdown sump. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
CDTF-126Q-MW03	Groundwater	This permanent monitoring well will be installed downgradient and northwest of the of the CDTF in the Buffer Zone. The sample data will indicate if groundwater has been impacted by the CDTF operations (pipelines, sumps, ASTs, etc.). The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
CDTF-126Q-MW04	Groundwater	This permanent monitoring well will be installed downgradient and northwest of the of the CDTF in the Buffer Zone. The sample data will indicate if groundwater has been impacted by the CDTF operations (pipelines, sumps, ASTs, etc.). The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
CDTF-126Q-MW05	Groundwater	This permanent monitoring well will be installed upgradient and southeast of the of the CDTF in the Buffer Zone. The sample data will indicate if the groundwater has been impacted upgradient of the CDTF. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.

Table 4-2

Surface, Subsurface, and Depositional Soil Sample Designations and QA/QC Sample Quantities
Chemical Defense Training Facility, Parcel 126Q-CWM
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
CDTF-126Q-GP01	CDTF-126Q-GP01-SS-BK0001-REG	soil	0-1	CDTF-126Q-GP01-SS-BK0002-FD	CDTF-126Q-GP01-SS-BK0003-FS		TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP01-DS-BK0004-REG	soil	a				
CDTF-126Q-GP02	CDTF-126Q-GP02-SS-BK0005-REG	soil	0-1			CDTF-126Q-GP02-SS-BK0005-MS	TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP02-DS-BK0006-REG	soil	a			CDTF-126Q-GP02-SS-BK0005-MSD	
CDTF-126Q-GP03	CDTF-126Q-GP03-SS-BK0007-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP03-DS-BK0008-REG	soil	a				
CDTF-126Q-GP04	CDTF-126Q-GP04-SS-BK0009-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP04-DS-BK0010-REG	soil	a				
CDTF-126Q-GP05	CDTF-126Q-GP05-SS-BK0011-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP05-DS-BK0012-REG	soil	a				
CDTF-126Q-GP06	CDTF-126Q-GP06-SS-BK0013-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP06-DS-BK0014-REG	soil	a				
CDTF-126Q-GP07	CDTF-126Q-GP07-SS-BK0015-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP07-DS-BK0016-REG	soil	a				
CDTF-126Q-GP08	CDTF-126Q-GP08-SS-BK0017-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP08-DS-BK0018-REG	soil	a				
CDTF-126Q-GP09	CDTF-126Q-GP09-SS-BK0019-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP09-DS-BK0020-REG	soil	a				
CDTF-126Q-GP10	CDTF-126Q-GP10-SS-BK0021-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP10-DS-BK0022-REG	soil	a				
CDTF-126Q-GP11	CDTF-126Q-GP11-SS-BK0023-REG	soil	0-1	CDTF-126Q-GP11-SS-BK0024-FD	CDTF-126Q-GP11-SS-BK0025-FS		TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP11-DS-BK0026-REG	soil	a				
CDTF-126Q-GP12	CDTF-126Q-GP12-SS-BK0027-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
CDTF-126Q-GP13	CDTF-126Q-GP13-SS-BK0028-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
CDTF-126Q-GP14	CDTF-126Q-GP14-SS-BK0029-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
CDTF-126Q-GP15	CDTF-126Q-GP15-SS-BK0030-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
CDTF-126Q-GP16	CDTF-126Q-GP16-SS-BK0031-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP16-DS-BK0032-REG	soil	a				
CDTF-126Q-GP17	CDTF-126Q-GP17-SS-BK0033-REG	soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
	CDTF-126Q-GP17-DS-BK0034-REG	soil	a				
CDTF-126Q-DEP01	CDTF-126Q-DEP01-DEP-BK0035-REG	depositional soil	0-1	CDTF-126Q-DEP01-DEP-BK0036-FD			TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides
CDTF-126Q-DEP02	CDTF-126Q-DEP02-DEP-BK0037-REG	depositional soil	0-1				TCL VOCs, TCL SVOCs, TAL Metals, Organophosphorus Pesticides

[a]Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

QA/QC - Quality assurance/quality control.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.

REG - Field sample.
FD - Field duplicate.
FS - Field split.

TAL - Target analyte list.
TCL - Target compound list.

MS/MSD - Matrix spike/matrix spike duplicate.

4.2.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from 11 soil borings installed at the CDTF site.

4.2.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is presented in Table 4-1. Subsurface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field observations.

4.2.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP (IT, 1998a).

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP (IT, 1998a). The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

Soil samples will be collected continuously to 12 feet bgs, or until refusal is reached. A detailed lithogic log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings above background (ambient air). Typically, the sample showing the highest reading (above background) will be selected and sent to the laboratory for analysis. If none of the samples collected indicate elevated readings above background (ambient air readings) using the PID, the deepest interval collected will be submitted to the laboratory for analysis. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects potential contaminants at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of contaminants and/or additional sample data would provide insight to the existence of any contaminants.

4.2.3 Permanent Monitoring Wells

Five permanent monitoring well boreholes will be drilled and installed using hollow-stem augers at the CDTF site. The permanent monitoring well locations are shown on Figure 4-1. The rationale for the monitoring well locations are presented in Table 4-1. The monitoring well boreholes will be drilled to the top of bedrock. Depth to bedrock is approximately 50 to 75 feet bgs at the site. The monitoring well casing will consist of new 2-inch inside-diameter, Schedule 40, threaded, flush-joint, polyvinyl chloride (PVC) pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap PVC well screen, approximately 10 feet long.

Soil samples for lithology will be collected continuously for every 5 feet to the total depth of the hole during hollow-stem auger drilling to provide a detailed lithologic log. The samples will be collected for lithology using a 24-inch-long, 2-inch-or-larger-diameter, split-spoon sampler. All soil borings will be logged in accordance with American Standard for Testing and Materials Method D 2488 using the Unified Soil Classification System. All soil samples will be screened in the field using a PID. There will not be any subsurface soil samples from these five monitoring well boreholes sent to the laboratory for analysis. The permanent monitoring wells will be drilled and installed as specified in Section 4.8 and Appendix C of the SAP. The exact monitoring well locations will be determined in the field by the on-site geologist, based on actual field conditions.

4.2.4 Groundwater Sampling

Five groundwater samples will be collected from the five permanent monitoring wells completed at the CDTF site presented in Section 4.2.3.

4.2.4.1 Sample Locations and Rationale

Groundwater samples will be collected from the permanent monitoring well locations shown on Figure 4-1. The groundwater sampling rationale is listed in Table 4-1. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-3.

4.2.4.2 Sample Collection

Prior to sampling monitoring wells, static water levels will be measured from each of the five monitoring wells installed at the site to define the groundwater flow in the residuum aquifer. Water level measurements will be performed as outlined in Section 4.18 of the SAP (IT, 1998a). Groundwater samples will be collected in accordance with the procedures outlined in Section 4.9.1.4 of the SAP.

Table 4-3

Groundwater Sample Designations and QA/QC Sample Quantities
Chemical Defense Training Facility, Parcel 126Q-CWM
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
CDTF-126Q-MW01	CDTF-126Q-MW01-GW-BK3001-REG	Groundwater	a	CDTF-126Q-MW01-GW-BK3002-FD	CDTF-126Q-MW01-GW-BK3003-FS		TCL VOCs, TCL SVOCs, TAL Metals, and Organophosphorus Pesticides
CDTF-126Q-MW02	CDTF-126Q-MW02-GW-BK3004-REG	Groundwater	a			CDTF-126Q-GP02-GW-BK3004-MS CDTF-126Q-MW02-GW-BK3004-MSD	TCL VOCs, TCL SVOCs, TAL Metals, and Organophosphorus Pesticides
CDTF-126Q-MW03	CDTF-126Q-MW03-GW-BK3005-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, and Organophosphorus Pesticides
CDTF-126Q-MW04	CDTF-126Q-MW04-GW-BK3006-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, and Organophosphorus Pesticides
CDTF-126Q-MW05	CDTF-126Q-MW05-GW-BK3007-REG	Groundwater	a				TCL VOCs, TCL SVOCs, TAL Metals, and Organophosphorus Pesticides

[a]Sample depth will depend on where sufficient first water is encountered to collect a water sample.

QA/QC - Quality assurance/quality control.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
REG - Field sample.
FD - Field duplicate.
FS - Field split.
MS/MSD - Matrix spike/matrix spike duplicate.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP (IT, 1998a). The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.5 Depositional Soil Sampling

Two depositional soil samples will be collected at the CDTF.

4.2.5.1 Sample Locations and Rationale

The depositional soil samples will be collected in the manmade surface drainage features on the west side of the CDTF site. The sampling rationale is listed in Table 4-1 and the proposed sampling locations are shown on Figure 4-1. The depositional soil sample designations, depth, and required QA/QC sample quantities are listed in Table 4-2. The actual depositional soil sample points will be at the discretion of the ecological sampler, based on the physical characteristics of the drainage area and actual field observations.

4.2.5.2 Sample Collection

The depositional soil sample collection will be conducted in accordance with the procedures for surface soil sample collection specified in Section 4.9.1.1 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.6 Surface Water Sampling

One surface water sample will be collected from the intermittent stream that flows northwest on the north side of the CDTF.

4.2.6.1 Sample Locations and Rationale

The surface water sampling rationale is listed in Table 4-1. The surface water sample will be collected from the proposed location on Figure 4-1. The surface water sample designation and required QA/QC sample requirements are listed in Table 4-4. The exact sampling location will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

Table 4-4

Surface Water and Sediment Sample Designations and QA/QC Sample Quantities
Chemical Defense Training Facility, Parcel 126Q-CWM
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
CDTF-126Q-SW/SD01	CDTF-126Q-SW/SD01-SW-BK2001-REG	Surface Water	N/A				TCL VOCs, TCL SVOCs, TAL Metals, and Organophosphorus Pesticides
CDTF-126Q-SW/SD01	CDTF-126Q-SW/SD01-SD-BK1001-REG	Sediment	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, and Organophosphorus Pesticides

QA/QC - Quality assurance/quality control.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
REG - Field sample.
N/A - Not applicable

4.2.6.2 Sample Collection

The surface water sample will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP. Sample documentation and chain-of-custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The sample will be analyzed for the parameters listed in Section 4.5.

4.2.7 Sediment Sampling

One sediment sample will be collected from the intermittent stream that flows northwest on the north side of the CDTF. This sediment sample will be collected at the same location as the surface water sample described in Section 4.2.6.

4.2.7.1 Sample Locations and Rationale

The proposed location for the sediment sample is shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. The sediment sample designation and required QA/QC sample requirements are listed in Table 4-4. The actual sediment sample point will be at the discretion of the ecological sampler, based on the drainage pathways and actual field observations.

4.2.7.2 Sample Collection

The sediment sample will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and chain-of-custody will be recorded as specified in Section 4.13 of the SAP. The sediment sample will be analyzed for the parameters listed in Section 4.5.

4.3 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP (IT, 1998a). Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.4 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging, and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the Alabama State Plane Coordinate System, 1983 North American Datum (NAD83). Elevations

will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for the soil sample locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use permanent monitoring wells at the CDTF, a higher level of accuracy is required. The permanent monitoring well locations will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required. Procedures to be used for GPS surveying are described in Section 4.3 of the SAP (IT, 1998a). Conventional land survey requirements are presented in Section 4.19 of the SAP.

4.5 Analytical Program

Samples collected at locations specified in this chapter will be analyzed for a specific suites of chemicals and elements based on the history of site usage, as well as EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the CDTF will consist of the following analytical suites:

- Target Compound List Volatile Organic Compounds - Method 5035/8260B
- Target Compound List Semivolatile Organic Compounds - Method 8270C
- Target Analyte List Metals - Method 6010B/7000
- Organophosphorus Pesticides - Method 8141A.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-5 in this SFSP and Table 6-1 in the QAP (IT, 1998a). Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

4.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP (IT, 1998a). Completed analysis request/COC records will be secured and included with each shipment of coolers to the following subcontract laboratory:

Table 4-5

Analytical Samples
Chemical Defense Training Facility, Parcel 126Q-CWM
Fort McClellan, Calhoun County, Alabama

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples: No. of Sample Points	No. of Events	No. of Field Samples	QA/QC Samples[a]: Field Dups (10%)	Splits w/ QA Lab (5%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Quanterra: Total No. Analysis	QA Lab: Total No. Analysis
CDTF: 6 water matrix samples (5 groundwater samples and 1 surface water sample); 33 **soil matrix samples** (17 surface soil samples, 13 subsurface soil samples, 2 depositional soil samples, and 1 sediment sample)													
TCL VOCs	8260B	water	normal	6	1	6	1	1	1	2	1	12	1
TCL SVOCs	8270C	water	normal	6	1	6	1	1	1		1	10	1
OP Pesticides	8141A	water	normal	6	1	6	1	1	1		1	10	1
Tot TAL Metals	6010B/7000	water	normal	6	1	6	1	1	1		1	10	1
TCL VOCs	8260B	soil	normal	29	1	29	3	2	2		1	37	2
TCL SVOCs	8270C	soil	normal	29	1	29	3	2	2		1	37	2
OP Pesticides	8141A	soil	normal	29	1	29	3	2	2		1	37	2
TAL Metals	6010B/7000	soil	normal	29	1	29	3	2	2		1	37	2
CDTF Subtotal:				140		16	12		12	2	8	190	12

[a]Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number. Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to:

Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Attn: John Reynolds
Tel: 423-588-6401
Fax: 423-584-4315

USACE Laboratory split samples are shipped to:

U.S. Army Engineer District, Savannah
Environmental & Materials District
Attn: Sample Receiving
200 North Cobb Parkway
Building 400, Suite 404
Marietta, Georgia 30062
Tel: 678-354-0310

MS/MSD - Matrix spike/matrix spike duplicate.
OP - Organophosphorus.
QA/QC - Quality assurance/quality control.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
VOC - Volatile organic compound.

Sample Receiving
Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Telephone: (423) 588-6401.

Split samples collected for the USACE laboratory will be shipped to the following address:

U.S. Army Engineer District, Savannah
Environmental & Materials Unit
Attn: Sample Receiving
200 North Cobb Parkway
Building 400, Suite 404
Marietta, Georgia 30062
Telephone: (678) 354-0310.

4.7 Investigation-Derived Waste Management

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP (IT, 1998a). The IDW expected to be generated at the CDTF site will include decontamination fluids and disposable personal protective equipment. The IDW will be staged in the fenced area around Buildings 335 and 336 while awaiting final disposal.

4.8 Site-Specific Safety and Health

Safety and health requirements for this baseline environmental investigation are provided in the SSHP attachment for the CDTF site, Parcel 126Q-CWM. The SSHP attachment will be used in conjunction with the SHP.

5.0 Project Schedule

The project schedule for the baseline environmental investigation activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team on a monthly basis.

6.0 References

Environmental Science and Engineering Inc. (ESE), 1998, ***Final Environmental Baseline Survey, Fort McClellan, Alabama***, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation (IT), 1998a, ***Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama***, August.

IT Corporation (IT), 1998b, ***Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama***, August.

Reisz Engineering, (Reisz), 1998, ***UST Progress Report***, October.

U.S. Army Corps of Engineers (USACE), 1999, ***Statement of Work for Task Order CK07, Site Investigation for the Chemical Defense Training Facility (CDTF) at Fort McClellan, Alabama***, January.

U.S. Army Corps of Engineers (USACE), 1994, ***Requirements for the Preparation of Sampling and Analysis Plans***, Engineer Manual EM 200-1-3, September 1.

U.S. Department of Agriculture (USDA), 1961, ***Soil Survey, Calhoun County, Alabama***, Soil Conservation Service, Series 1958, No. 9, September.

U.S. Department of Army (Army), 1997, ***Toxic Chemical Agent Safety Standards, Pamphlet 385-61***, March 31.

U.S. Department of Army (Army), 1978, Headquarters, ***Department of the Army Technical Bulleting TB 700-4***, October.

U.S. Environmental Protection Agency (EPA), 1993, ***Data Quality Objectives Process for Superfund, Interim Final Guidance***, EPA 540-R-93-071, September.

Weston, Roy F., Inc. (Weston), 1990, ***Final USATHAMA Task Order 11, Enhanced Preliminary Assessment, Fort McClellan, Anniston, Alabama,*** prepared for U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland, December.

APPENDIX A

UST PROGRESS REPORT, OCTOBER 6, 1998
REISZ ENGINEERING

REISZ ENGINEERING
3322 MEMORIAL PARKWAY S. • SUITE 221
POST OFFICE BOX 1349
HUNTSVILLE, ALABAMA 35807-1349
TELEPHONE (256) 883-2531
FAX (256) 883-2589
EMAIL: admin@reiszengr.com

TO: Lee Jaye, DOE
FROM: Alvin Crawford
SUBJECT: UST Progress Report
DATE: October 6, 1998

1. After a considerable amount of coordination between DOE, EG&G, GeoProbe, and Reisz Engineering, the excavations date and removal of the underground storage tank (UST) was set to be September 17, 1998.

2. Reisz Engineering was on hand to observe the excavation and removal of the tank, as well as, the backfilling of the excavation pit. While observing the procedure, careful consideration was taken to record data and note steps and procedures that would be beneficial in completing the ADEM closure report. In addition to the completion of the closure report, VOC emissions were calculated and attached to the report. Also appended were illustrative diagrams of the tank excavation, sample locations, and soil layers.

3. After the tank was removed, the tank was inspected for any noticeable holes and leaks and it was confirmed that the tank was in premium condition. Sampling was then completed by taking four samples around the tank, one positioned in the trench of the piping, and one at the base of the tank. The samples were brought to a pre-approved laboratory and the analysis has already been received. The analysis complies with all requirements and regulations of ADEM closure report.

4. To determine the depth of groundwater and the location of bedrock, GeoProbe conducted a subsurface exploration of the area. As a result of the boring, the depth of the bedrock was determined to be 25 feet below the surface. Since bedrock was discovered before hitting the groundwater, there was no need in continuing the exploration. During the boring, soil layers and their thickness was noted.

5. The completed closure report has been submitted to DOE (Lee Jaye).

Sincerely,

Alvin Crawford

Alvin Crawford
Project Manager/Civil Engineer

ADEM UST CLOSURE
SITE ASSESSMENT REPORT
(Use a separate form for a group of tanks in each tank pit)

Facility I.D. No.: 11953

Date of this Report: 9/30/98

Incident No.(If applicable)
UST _ _ _ _ _ _

UST Owner: Fort McClellan

Facility County: Calhoun
Facility Name: CDTF
Location: Fort McClellan

Address: Directorate of Environment, Bldg 141A
Fort McClellan, AL 36205-5000
Contact: Lee Jaye

Address: Chemical Decontamination Training Facility, Fort McClellan, AL 36205

Contact Telephone No.:
(256) 848-3120

Name of Contractor and/or Consultant used to close tanks: Reisz Engineering

Name of Laboratory used: Guardian Systems, Inc.

PRIOR TO BEGINNING CLOSURE, THE CONTRACTOR SHOULD BECOME FAMILIAR WITH ALL CLOSURE PROCEDURES IN API BULLETIN 1604, "REMOVAL AND DISPOSAL OF USED UNDERGROUND PETROLEUM STORAGE TANKS".

Number of Tanks Closed: 1

Number of tanks remaining at site: 1, above ground

Closure Date:

Tank Identification #	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5
Tank Size	8' dia.				
Tank Capacity	5,000gal				
Tank Age	13 yrs.				
Date Tank Last Used	9/11/98				
Substance Stored	diesel				
Type of Product Piping (pressurized/suction)	steel				
Farm Tank	[ ]	[ ]	[ ]	[ ]	[ ]
Heating Oil Tank	[ ]	[ ]	[ ]	[ ]	[ ]

1. Tank Closure by Removal

   a. Attach site maps showing the general location of the facility.

   b. Attach plan and sectional views of the excavation and include the following:

      1. All appropriate excavation dimensions.

      2. All soil sample locations and depths using an appropriate method of identification.

      3. Location of areas of visible contamination.

      4. Former location of tank(s), including depth, with tank Identification Number.

c. Is the groundwater more than 5 feet below the bottom of the excavation? YES X NO _____ If not, provide the depth from the ground surface to the groundwater table. _____ ft. Method used to determine water table depth:
1. Excavation extended 5 feet below base of pit _____
2. Boring or Monitor well Bored down to 25 feet when hit bedrock
3. Topographic features _____
(Method must be approved by Department prior to use.)

d. Was there a notable product odor found in the excavation? YES _____ NO X If yes;
1. The odor strength was (mild)(strong)(other, describe _____)
2. The odor indicates what type of product? (gasoline)(diesel)(waste oil)(kerosene)(other _____)

e. Was there water in the excavation? YES _____ NO X
If yes, how was it handled?
1. One time discharge to sanitary sewer with local approval _____
2. Hauled to facility capable of treating constituents of petroleum products in water _____
3. Hauled to local POTW with local approval _____
4. Other (specify) _____

f. Was free product found in the excavation? YES _____ NO X
If yes;
1. How was free product handled? _____
2. What was the measured thickness of free product? _____

g. Were visible holes noted in the tank(s)? YES _____ NO X
If yes, please indicate which tank(s) by the Identification Number _____. Also, describe the location(s) and provide general description as to the size and number of holes for above noted tanks, (Example: 3 square feet of pinholes or 3 inch diameter hole):

h. Describe the soil type and thickness of all soil layers encountered in the excavation: 0 to -3", Asphalt; -3" to -9", Asphalt base; -9" to -13" Gravely clay; -13" to -20", red clay; -20" to -44", brown clay; -44" to -84"; brown sandy clay; -84" to -120"; brown sandy clay loam. (Refer to attached picture.)

i. Was the excavation backfilled? YES X NO _____ If yes, provide the date. 9/17/98 DO NOT BACKFILL WITH MATERIAL THAT HAS OR POTENTIALLY HAS A TPH OF GREATER THAN 100 PPM.

2. Tank Closure Without Removal

a. Attach site maps showing the general location of the facility.

b. Attach plan and sectional views of the site and include the following:
   1. Location of the tank(s) including depth,
   2. Location of tank(s) with respect to other tanks, if applicable,
   3. Soil boring locations and depth at which soil samples were taken.
   4. Boring logs

c. Is the groundwater more than 5 feet below the bottom of the tank?
YES _____ NO _____ If no, provide the depth from the ground surface to the groundwater table. _____ ft.
Method used to determine water table depth: _____
   1. Boring or Monitor Well _____
   2. Topographic features _____
   (Method must be approved by Department prior to use)

d. Was there a notable product odor found in the bore holes?
YES _____ NO _____ If yes;
   1. The odor strength was (mild)(strong)(other, describe _____ _____)
   2. The odor indicates what type of product? (gasoline)(diesel) (waste oil)(kerosene)(other _____)

e. Was there free product in the bore holes? YES _____ NO _____
If yes;
   1. How was free product handled? _____ _____
   2. What was the measured thickness of the free product? _____ _____

f. Describe the soil type and thickness of all soil layers encountered in the bore holes and provide boring logs. _____ _____ _____ _____

g. Specify the inert solid material used to fill the tank(s). _____ _____

h. Provide the date the tank(s) were filled. _____

i. Were the bore holes properly sealed with bentonite/soil?
YES _____ NO _____ If yes, provide the date: _____

3. Product Piping Closure by Removal

a. Attach site maps showing the general location of the facility.

b. If the piping was longer than 10 feet, attach plan and sectional views of the piping trench and include the following:

   1. All appropriate excavation dimensions and length of piping,
   2. All soil sample locations and depths using an appropriate method of identification,
   3. Location of areas of visible contamination.

c. Was the piping purged of product prior to closure?
YES _____ NO _____

d. Is the groundwater more than 5 feet below the bottom of the piping trench? YES _____ NO _____ If not, provide the depth from the ground surface to the groundwater table depth:

1. Excavation extended 5 feet below base of trench _____
2. Boring or Monitor Well _____
3. Topographic features _____
(Method must be approved by Department prior to use.)

e. Was there a notable product odor found in the piping trench?
YES _____ NO _____ If yes;
1. The odor strength was (mild)(strong)(other, describe _____
_____)
2. The odor indicates what type of product? (gasoline)(diesel)
(waiste oil)(kerosene)(other _____
_____)

f. Was there water in the piping trench? YES _____ NO _____
1. One time discharge to sanitary sewer with local approval _____
_____
2. Hauled to facility capable of treating constituents of petroleum products in water _____
3. Hauled to local POTW with local approval _____
4. Other (specify) _____

g. Was there free product found in the piping trench? YES _____
NO _____ If yes,
1. How was the free product handled?_____
_____
2. What was the measured thickness of the free product? _____
_____

h. Were visible holes noted in the piping? YES_____ NO_____
If yes, please indicate the location(s) and provide a general description as to the size and number of holes _____
_____
_____
_____

i. Describe the soil type and thickness of all soil layers encountered in the piping trench: _____
_____
_____

j. Was the piping trench backfilled? YES _____ NO _____
If yes, provide the date _____ DO NOT BACKFILL WITH MATERIAL THAT HAS OR POTENTIALLY HAS A TPH OF GREATER THAN 100 PPM.

4. Product Piping Closure Without Removal

a. Attach site maps showing the general location of the facility.

b. Attach plan and sectional views of the site and include the following:
   1. Location of the piping including depth,
   2. Location of piping with respect to tank(s), if applicable,
   3. Soil boring locations and depth at which soil samples were taken.
   4. Boring logs.

c. Was the piping purged of product prior to closure? YES X
NO _____

d. Was the piping capped? YES X NO _____

e. Is the groundwater more than 5 feet below the bottom of the piping YES X NO _____ If no, provide the depth from the ground surface to the groundwater table. _____

f. Was there a notable product odor found in the bore holes? YES _____ NO X If yes:
   1. The odor strength was (mild)(strong)(other, describe _____
   2. The odor indicates what type of product? (gasoline)(diesel) (waste oil)(kerosene)(other _____

g. Was there free product in the bore holes? YES _____ NO X
If yes;
   1. How was free product handled? _____
   2. What was the measured thickness of the free product? _____

h. Describe the soil type and thickness of all soil layers encountered in the bore holes and provide boring logs. 0 to -10' same as excavation Soil types. -10' to -17', brownish gray sandy clay; -17' to -21', gray sandy clay; -21' to -23', firm greenish gray sandy clay; and -23' to -25', stiff green clay.

i. Were the bore holes properly sealed with bentonite/soil? YES X NO _____ If yes, provide the date 9/17/98

5. Groundwater Sampling (If required by attached closure guidelines)

a. Indicate the following on the plan and sectional views required by Section 1.b, 2.b 3.b or 4.b above:
   1. The location and depth of the 1 up-gradient and 3 down-gradient borings or monitoring wells. (Monitoring wells in lieu of borings are not required, but may be desirable in certain situations.)
   2. The most probable direction of groundwater flow. State basis for determining direction _____

If yes, attach a schematic drawing of the work.

6. Laboratory Data

a. Attach the original chain of custody record (copies are not acceptable) for each sample which includes at least the following:
   1. Sample identification number,
   2. Date and time sample was taken,
   3. Name and title of person collec
      requirement on page 8 of this f
   4. Type of sample (soil or water),
   5. Type of sample container,
   6. Method of preservation,
   7. Date and time sample was relinq
   8. Person relinquishing sample,
   9. Date and time sample was receiv
   10. Person receiving sample at lab.

Pit Volume:

16 x 15 X 10 = 2400 cu ft.

Tank Volume:

$\pi D^2 L = \frac{\pi (8)^2 L}{4} = 753.98$ cu. ft. - 1646.02

60.96 cu yd.

b. Attach the original laboratory data
   acceptable) which includes at least
   1. A sample identification method
      with the soil sample locations
      sectional views required by Sect
   2. The sample analytical results with appropriate units,
   3. The method used to analyze each sample,
   4. The date and time the sample was analyzed,
   5. The person analyzing each sample.

7. Excavated Soil

ALL EXCAVATED SOIL REQUIRES ANALYSIS PRIOR TO DISPOSAL. TANK CLOSURE SAMPLES FROM THE EXCAVATION MAY NOT BE REPRESENTATIVE OF THE LEVEL OF CONTAMINATION IN THE EXCAVATED SOIL.

For safety and other considerations, it is recommended that open pits should be backfilled as soon as possible with clean backfill. Soils which have TPH levels greater than 100 ppm or soils for which the level of contamination has not been determined shall not be returned to the excavation pit(s). Soils having TPH levels between 10 and 100 ppm can only be returned to the excavation pit if the depth to groundwater is greater than 5 feet from the base of the pit.

a. If tank was closed by removal, provide an estimate of the volume of soil removed. 60.96 cubic yds.

b. Attach "Total Potential VOC Emissions Calculations" for soil removed.

c. Indicate method of soil disposal to be used:
   1. Return to the excavation pit only when TPH is less than or equal to 100 ppm and depth of groundwater is greater than 5 feet from the base pit.
   2. Spread in a thin layer on site only when TPH is less than or equal to 100 ppm.
   3. Disposal in a landfill (See attached "Guidelines for the Disposal of Non-Hazardous Petroleum Contaminated Wastes")

4. Incineration
5. Thermal volatilization
6. Other _____

d. If soil was disposed of, indicate the final destination and if applicable, attach copies of invoices or receipts.

_____

_____

_____

8. Tank Cleaning

a. The tank(s) were cleaned in accordance with American Petroleum Institute (API) Publication 2015? YES ___X___ NO _____
If no, describe how tank(s) were cleaned._____

_____

_____

_____

b. Provide an estimate of the volume of sludge removed from the tank.
~100 gallons

c. Indicate the final destination of the sludge and attach invoices or receipts. Ownership was granted to Dennis Borden to be used as an above ground tank.

_____

_____

MEMORANDUM January 28, 1991

ADEM UST CLOSURE
TOTAL POTENTIAL VOC EMMISSIONS CALCULATIONS

Facility I.D. No.: 11953 Date of this Report: 9/24/98

Facility County: Calhoun UST Owner: Fort McClellan

Facility Name: CDTF UST Owner: "

Location: Fort McClellan Owner Address: DSE, Bldg 147A

Address: Fort McClellan, AL 36205 Fort McClellan, AL 36205-5002

*Contact: Lee Taye

*Contact Telephone No.: (256) 848-3820

Name of Consultant who performed calculations: Reisz Engineering

Consultants Phone Number: (256) 883-2531

.17276

	a		b			c	
Sample 1	12	ppm x	60.96	cyds x .002 =		1.46	lbs VOC emissions
Sample 2	18	ppm x	60.96	cyds x .002 =		2.19	lbs VOC emissions
Sample 3	89	ppm x	60.96	cyds x .002 =		10.85	lbs VOC emissions
Sample 4	65	ppm x	60.96	cyds x .002 =		7.92	lbs VOC emissions
Sample 5	<10	ppm x	60.96	cyds x .002 =		1.24	lbs VOC emissions
Sample 6		ppm x		cyds x .002 =			lbs VOC emissions
Sample 7		ppm x		cyds x .002 =			lbs VOC emissions
Sample 8		ppm x		cyds x .002 =			lbs VOC emissions
Sample 9		ppm x		cyds x .002 =			lbs VOC emissions
Sample 10		ppm x		cyds x .002 =			lbs VOC emissions
Sample 11		ppm x		cyds x .002 =			lbs VOC emissions
Sample 12		ppm x		cyds x .002 =			lbs VOC emissions
Sample 13		ppm x		cyds x .002 =			lbs VOC emissions
Sample 14		ppm x		cyds x .002 =			lbs VOC emissions
Sample 15		ppm x		cyds x .002 =			lbs VOC emissions
Sample 16		ppm x		cyds x .002 =			lbs VOC emissions
Sample 17		ppm x		cyds x .002 =			lbs VOC emissions
Sample 18		ppm x		cyds x .002 =			lbs VOC emissions
Sample 19		ppm x		cyds x .002 =			lbs VOC emissions
Sample 20		ppm x		cyds x .002 =			lbs VOC emissions
TOTAL POTENTIAL EMMISSIONS						23.66	lbs VOC emissions

20' = 6.6667
15' = 5 yd
10' = 3.333
4' = 1.333

5,000 gal = 668.45 ft³
V = πr²h
668.4 = π(4)²h
h = 13.36
= 4.43 yds

* Note - If more samples are taken than indicated on this form, please attach additional pages as necessary.

This form must be completed and submitted with the ADEM UST Closure Assessment Report form.

Volume of excavation: L x W x h = 154 x 10 x 15' = 2314 cu ft. = 85.69

Volume of tanks = πr²h = π(1.333)²(4.43) V = 24.73 yds³

- Volume of excavation - volume of tanks = 85.67 - 24.13 = 60.96

THIS FORM SHOULD BE COMPLETED AND RETURNED, ALONG WITH ANY OTHER PERTINENT INFORMATION, TO THE FOLLOWING ADDRESS.

The Alabama Department of Environmental Management
Groundwater Branch
1751 Congressman W.L. Dickinson Drive
Montgomery, AL 36130
(205) 270-5655

INCOMPLETE FORMS WILL BE RETURNED FOR CORRECTION.

Name of person taking soil and/or groundwater samples: Alvin Crawford
Company: Reisz Engineering
Telephone Number: (256) 883-2531

I certify under penalty of law that I have obtained representative soil and/or groundwater samples using accepted sampling procedures.

Signature: Alvin B. Crawford Date: 9-30-98

Name of Engineer or Geologist performing closure and completing Form: Alvin Crawford
Company: Reisz Engineering
Telephone Number: (256) 883-2531

I certify under penalty of law that I have completed a four year course in Engineering and/or Geology at a college or university and that the information I have provided is true to the best of my belief and knowledge.

Signature of Geologist or Engineer: Alvin B. Crawford Date: 9-30-98

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Signature of Tank Owner: _____ Date _____

API BULLETINS 1604 AND 2015 ARE AVAILABLE FROM ADEM UPON REQUEST.

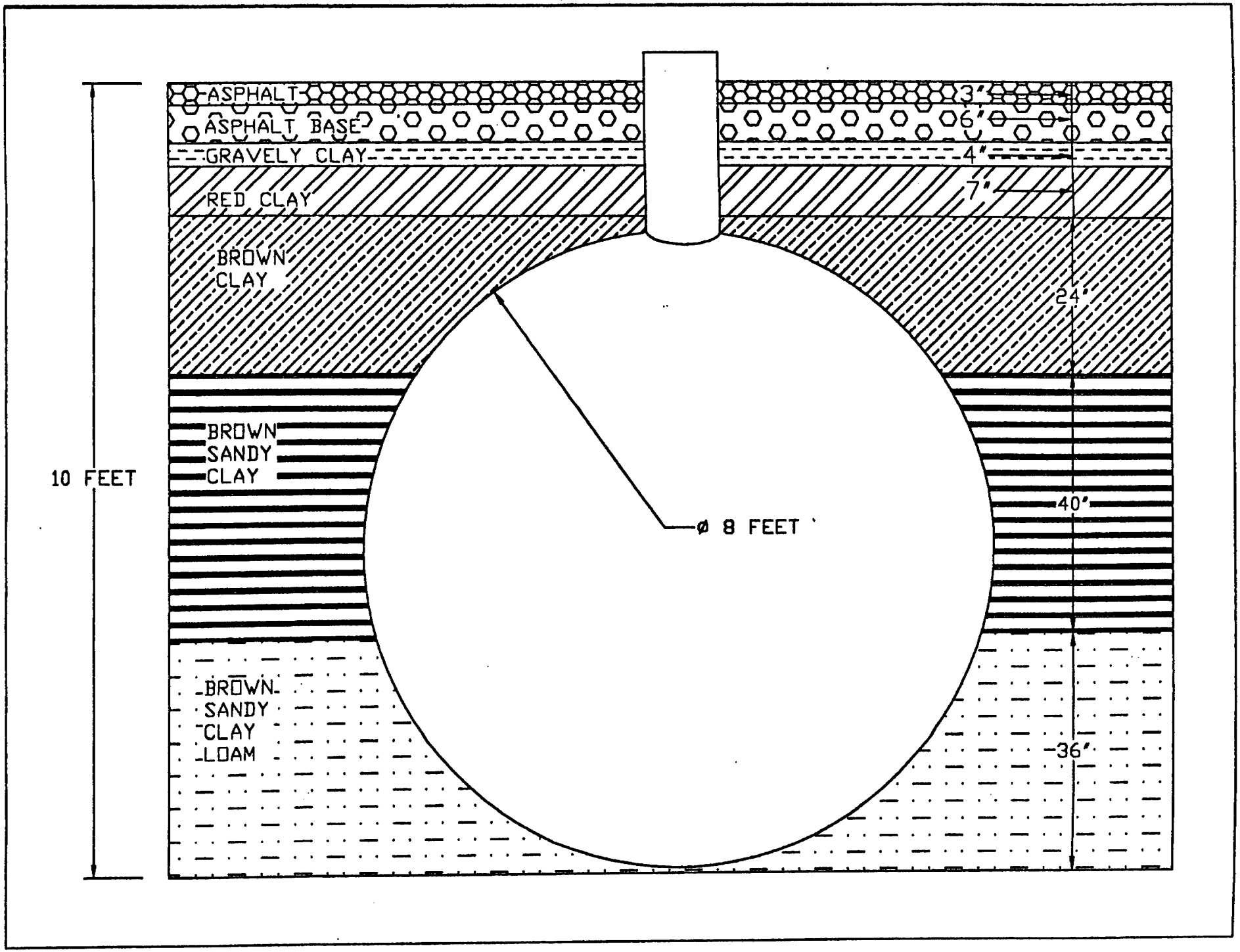
For ADEM Use:

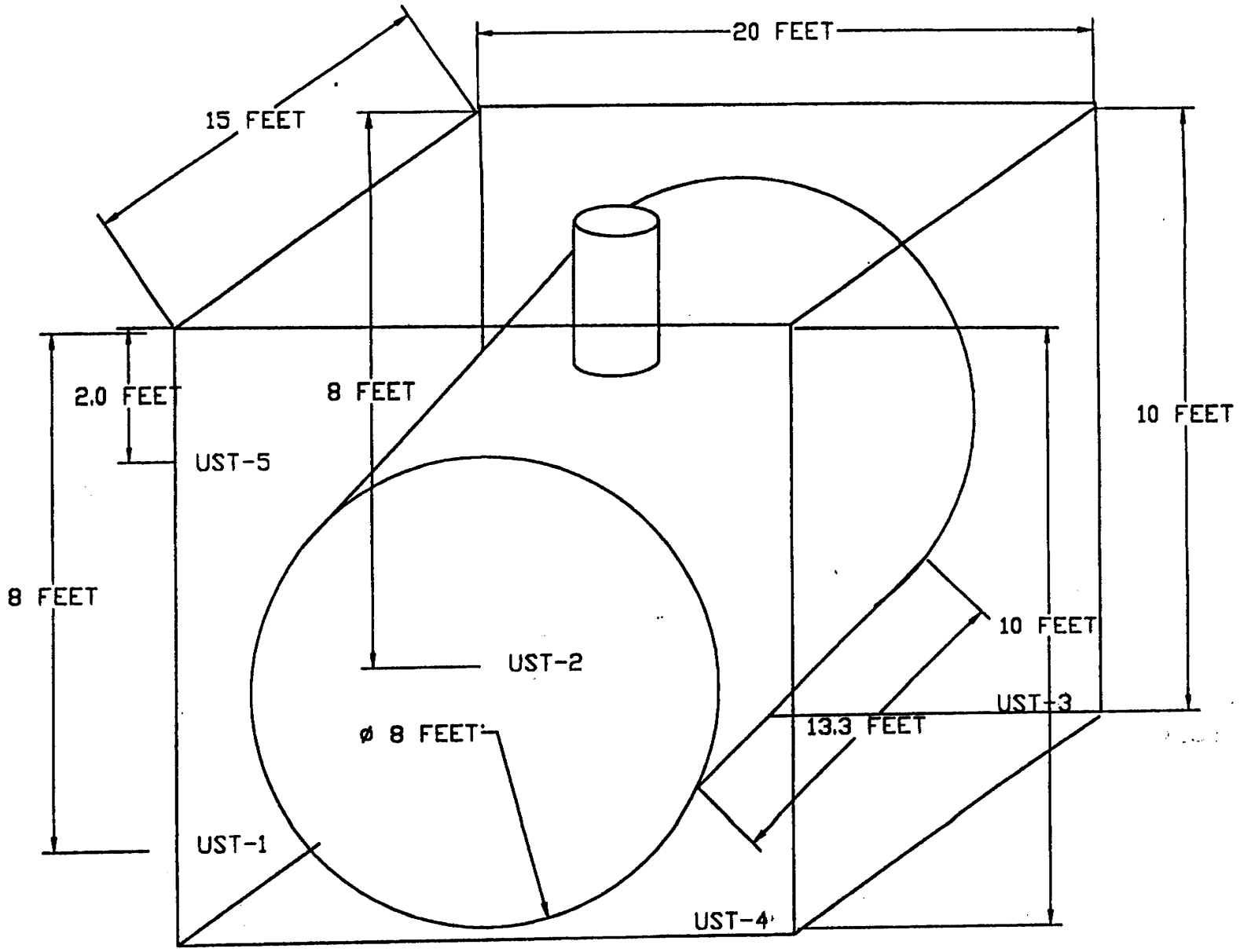
Reviewed by:_____ Date:_____

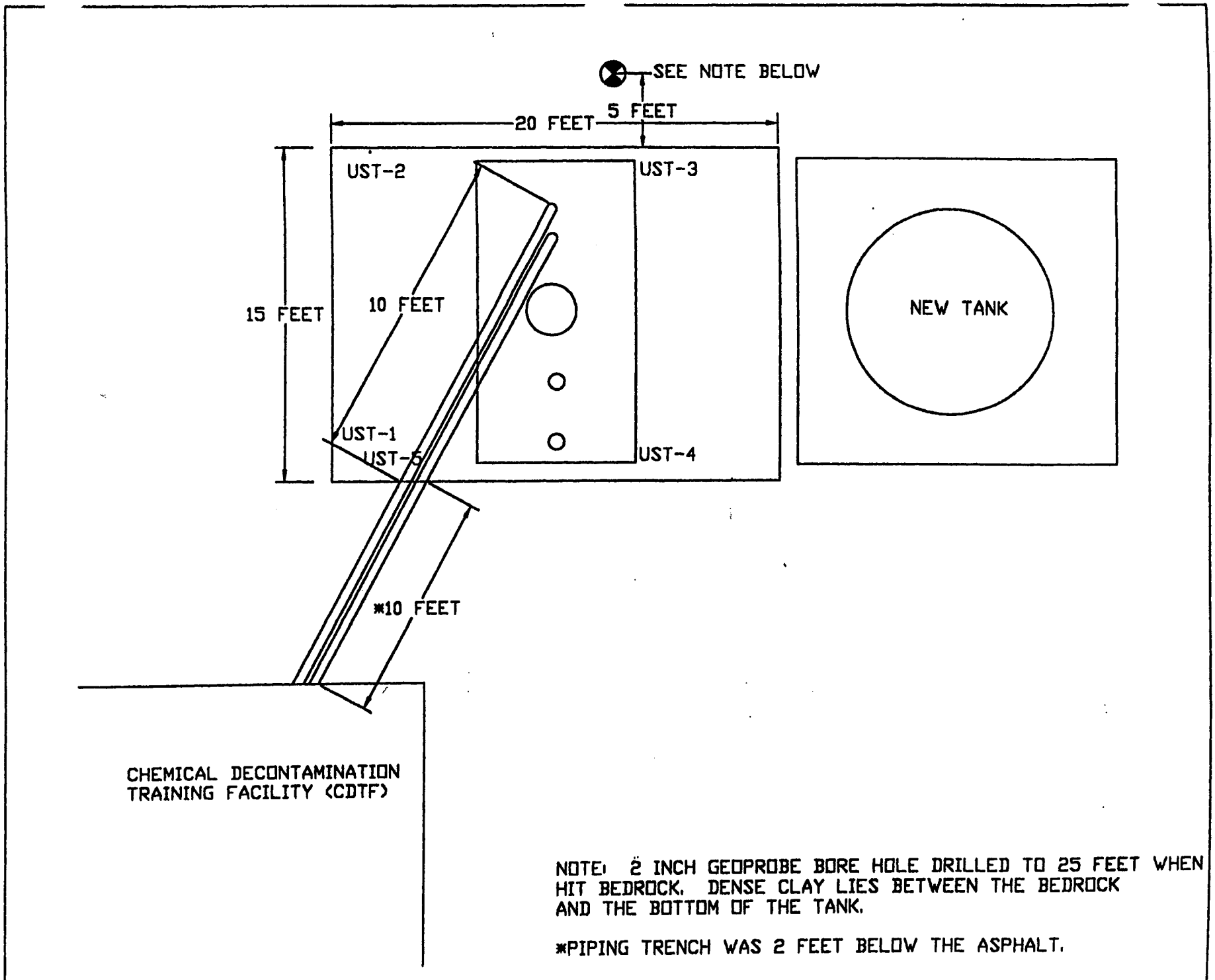
Comments:_____

GRWATER3
WP+ 1538
10/5/92

Attachment UST Closure Guidelines
(Remove from closure letter)


ASPHALT
ASPHALT BASE
GRAVELY CLAY
RED CLAY
BROWN CLAY
BROWN SANDY CLAY
BROWN SANDY CLAY LOAM
10 FEET
Ø 8 FEET
3"
6"
4"
7"
24"
40"
36"


20 FEET
15 FEET
2.0 FEET
8 FEET
10 FEET
UST-5
8 FEET
10 FEET
UST-2
UST-3
13.3 FEET
ø 8 FEET
UST-1
UST-4


SEE NOTE BELOW
5 FEET
20 FEET
UST-2
UST-3
15 FEET
10 FEET
NEW TANK
UST-1
UST-5
UST-4
*10 FEET
CHEMICAL DECONTAMINATION
TRAINING FACILITY (CDTF)
NOTE: 2 INCH GEOPROBE BORE HOLE DRILLED TO 25 FEET WHEN HIT BEDROCK. DENSE CLAY LIES BETWEEN THE BEDROCK AND THE BOTTOM OF THE TANK.
*PIPING TRENCH WAS 2 FEET BELOW THE ASPHALT.

GUARDIAN SYSTEMS, INC.

305 Ashville Road
P.O. Box 190
Leeds, Alabama 35094

Telephone 205/699-6647
Wats 800/738-5719
Fax 205/699-3882

Report Date: 9/21/98
Receive Date: 9/17/98
Receive Time: 15:48

Reisz Engineering
3322 Memorial Parkway S
Huntsville,, AL 35801

Attention:

Control No : 9809-00313 Sample # 001
Sampler : AC
Sample ID : Proj. FM-UST, UST-1

Sample Date: 9/17/98
Sample Time: 9:55

LABORATORY CERTIFICATE

PARAMETER	RESULTS	UNITS	ANAL	DATE	TIME	METHOD		DETECTION LIMITS	
Total Petroleum Hydrocarbons	12.	mg/kg	GT	9/18/98	12:50	418.1		10	mg/kg
BETX, Method 8260			DH	9/18/98	13:26				
Benzene	<5.0	ug/kg	DH	9/18/98	13:26	8260	(3)	5	ug/kg
Ethylbenzene	<5.0	ug/kg	DH	9/18/98	13:26	8260	(3)	5	ug/kg
Toluene	<5.0	ug/kg	DH	9/18/98	13:26	8260	(3)	5	ug/kg
Xylenes, Total	<5.0	ug/kg	DH	9/18/98	13:26	8260	(3)	5	ug/kg

Approved by: Charles M. Johnson

---METHOD REFERENCES---

(1) Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-20, revised March 1983
(2) Standard Methods for the Examination of Water and Waste Water, 17th. Edition, 1989
(3) Test Methods for Evaluating Solid Wastes PhysicalChemical Method SW-846, 3rd Edition, EPA 1994
(4) 1987 ASTM Annual Standards
(5) Code of Federal Regulations, Title 40, Part 136, Appendix A
(6) Methods for the Determination of Organic Compounds in Drinking Water, EPA-600/4-88/039, December 1988

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Report Date: 9/21/98
Receive Date: 9/17/98
Receive Time: 15:48

Reisz Engineering
3322 Memorial Parkway S
Hunstville,, AL 35801

Attention:

Control No : 9809-00313 Sample # 002
Sampler : AC
Sample ID : Proj. FM-UST, UST-2

Sample Date: 9/17/98
Sample Time: 10:15

LABORATORY CERTIFICATE

PARAMETER	RESULTS	UNITS	ANAL	DATE	TIME	METHOD		DETECTION LIMITS	
Total Petroleum Hydrocarbons	18.	mg/kg	GT	9/18/98	12:50	418.1		10	mg/kg
BETX, Method 8260			DH	9/18/98	14:06				
Benzene	<5.0	ug/kg	DH	9/18/98	14:06	8260	(3)	5	ug/kg
Ethylbenzene	<5.0	ug/kg	DH	9/18/98	14:06	8260	(3)	5	ug/kg
Toluene	<5.0	ug/kg	DH	9/18/98	14:06	8260	(3)	5	ug/kg
Xylenes, Total	<5.0	ug/kg	DH	9/18/98	14:06	8260	(3)	5	ug/kg

Approved by: Charles M. Johnson

---METHOD REFERENCES---

(1) Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-20, revised March 1983
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(3) Test Methods for Evaluating Solid Wastes PhysicalChemical Method SW-846, 3rd Edition, EPA 1994
(4) 1987 ASTM Annual Standards
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Fax 205/699-3882

Reisz Engineering
3322 Memorial Parkway S
Hunstville,, AL 35801

Report Date: 9/21/98
Receive Date: 9/17/98
Receive Time: 15:48

Attention:

Control No : 9809-00313 Sample # 003
Sampler : AC
Sample ID : Proj. FM-UST, UST-3

Sample Date: 9/17/98
Sample Time: 11:25

LABORATORY CERTIFICATE

PARAMETER	RESULTS	UNITS	ANAL	DATE	TIME	METHOD		DETECTION LIMITS	
Total Petroleum Hydrocarbons	89.	mg/kg	GT	9/18/98	12:50	418.1		10	mg/kg
BETX, Method 8260			DH	9/18/98	14:47				
Benzene	<5.0	ug/kg	DH	9/18/98	14:47	8260	(3)	5	ug/kg
Ethylbenzene	<5.0	ug/kg	DH	9/18/98	14:47	8260	(3)	5	ug/kg
Toluene	<5.0	ug/kg	DH	9/18/98	14:47	8260	(3)	5	ug/kg
Xylenes, Total	<5.0	ug/kg	DH	9/18/98	14:47	8260	(3)	5	ug/kg

Approved by: Charles M. Johnson

---METHOD REFERENCES---

(1) Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-20, revised March 1983
(2) Standard Methods for the Examination of Water and Waste Water, 17th. Edition, 1989
(3) Test Methods for Evaluating Solid Wastes PhysicalChemical Method SW-846, 3rd Edition, EPA 1994
(4) 1987 ASTM Annual Standards
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Reisz Engineering
3322 Memorial Parkway S
Hunstville,, AL 35801

Report Date: 9/21/98
Receive Date: 9/17/98
Receive Time: 15:48

Attention:

Control No : 9809-00313 Sample # 004
Sampler : AC
Sample ID : Proj. FM-UST, UST-4

Sample Date: 9/17/98
Sample Time: 11:20

LABORATORY CERTIFICATE

PARAMETER	RESULTS	UNITS	ANAL	DATE	TIME	METHOD		DETECTION LIMITS	
Total Petroleum Hydrocarbons	65.	mg/kg	GT	9/18/98	12:50	418.1		10	mg/kg
BETX, Method 8260			DH	9/18/98	15:48				
Benzene	<5.0	ug/kg	DH	9/18/98	15:48	8260	(3)	5	ug/kg
Ethylbenzene	<5.0	ug/kg	DH	9/18/98	15:48	8260	(3)	5	ug/kg
Toluene	<5.0	ug/kg	DH	9/18/98	15:48	8260	(3)	5	ug/kg
Xylenes, Total	<5.0	ug/kg	DH	9/18/98	15:48	8260	(3)	5	ug/kg

Approved by: Charles M. Johnson

---METHOD REFERENCES---

(1) Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-20, revised March 1983
(2) Standard Methods for the Examination of Water and Waste Water, 17th. Edition, 1989
(3) Test Methods for Evaluating Solid Wastes PhysicalChemical Method SW-846, 3rd Edition, EPA 1994
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Fax 205/699-3882

Report Date: 9/21/98
Receive Date: 9/17/98
Receive Time: 15:48

Reisz Engineering
3322 Memorial Parkway S
Hunstville,, AL 35801

Attention:

Control No : 9809-00313 Sample # 005
Sampler : AC
Sample ID : Proj. FM-UST, UST-5

Sample Date: 9/17/98
Sample Time: 10:10

LABORATORY CERTIFICATE

PARAMETER	RESULTS	UNITS	ANAL	DATE	TIME	METHOD		DETECTION LIMITS	
Total Petroleum Hydrocarbons	<10.	mg/kg	GT	9/18/98	12:50	418.1		10	mg/kg
BETX, Method 8260			DH	9/18/98	16:30				
Benzene	<5.0	ug/kg	DH	9/18/98	16:30	8260	(3)	5	ug/kg
Ethylbenzene	<5.0	ug/kg	DH	9/18/98	16:30	8260	(3)	5	ug/kg
Toluene	<5.0	ug/kg	DH	9/18/98	16:30	8260	(3)	5	ug/kg
Xylenes, Total	<5.0	ug/kg	DH	9/18/98	16:30	8260	(3)	5	ug/kg

Approved by: Charles M. Johnson

---METHOD REFERENCES---

(1) Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-20, revised March 1983
(2) Standard Methods for the Examination of Water and Waste Water, 17th. Edition, 1989
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GUARDIAN SYSTEMS, INC.
305 Ashville Road, P.O. Box 190
Leeds, Alabama 35094
(205) 699-6647 (205) 699-3882 Fax

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST

Client: Ft McClellan	Phone: (256) 883-2531
Company: Reisz Engineering	Fax: 883-2589
Address:	P.O.# :
	Project #: FM-UST

Sample I.D.	Sample Date	Sample Time	Sampler Initials	Sample Type	Sample Description	Sample Preservative	Analysis Requested: TPH	BTEX
UST-1	9-17-98	9:55	AC	Soil		NA		
UST-2	9-17-98	10:15	AC	Soil				
UST-3	9-17-98	11:25	AC	soil				
UST-4	9-17-98	11:20	AC	Soil				
UST-5	9-17-98	10:10	AC	soil				

Relinquished by: ~~Alvin Crawford~~ Date: 9-17-98 Time: 1:28 Received by: Jeff Robertson Date: 9-17-98 Time: 1:28

Relinquished by: Date: 9/17/98 Time: 1559 Received by: Date: Time:

Relinquished by: Date: Time: Received by: Date: Time:

Received for Laboratory by: Date: 9/17/98 Time: 1559

Was shipping container intact when received by Lab? Yes ✓ No ___ Initials PRH Seals intact? Yes N/A No ___

Were all samples properly preserved? Yes ✓ No ___ Initials PRH Sample temp ___ C

Comments:

Preservatives: HCl, HNO3, H2SO4, NaOH, Thiosulfate, Sulfite, ZnOAc, none, Cool 4C; Sample Type: Grab or Composite